

WHAT IS CLAIMED IS:

1. A method of producing heat-insulating composite paper containers comprising the steps of:

5 A) providing at least one fabricated container comprised of a side body and a bottom panel, at least a portion of each container formed of paper provided on an area thereof with a foamable thermoplastic polymeric material which defines a foamable area of the container;

10 B) placing said at least one fabricated container in contact with at least one mandrel; and

15 C) heating said at least one mandrel with the fabricated container in contact therewith to a temperature and for a time period sufficient to cause the foamable material to foam under the action of moisture vapor released from the paper.

20 2. The method according to claim 1, wherein step B includes supporting the at least one fabricated container on the at least one mandrel in a manner preventing the foamable area of the at least one fabricated container from making contact with a foamable area of another fabricated container while being conveyed.

3. The method according to claim 2 wherein step C further comprises supporting the at least one fabricated container on its mandrel such

that a supporting portion of the mandrel extends through a mouth of the at least one fabricated container.

4. The method according to claim 3 wherein step C further comprises supporting the at least one fabricated container in an inverted state, with the supporting portion of the mandrel extending upwardly through the mouth of the fabricated container.

5. The method according to claim 4 wherein step C further comprises supporting the bottom panel of the at least one fabricated container on an upper end of the supporting portion of the holder.

6. The method according to claim 1 wherein step A further comprises providing an inner surface of the side body with a non-foamable thermoplastic polymeric material.

7. The method according to claim 6 wherein step A further comprises providing an inner surface of the bottom panel of the at least one fabricated container with a non-foamable thermoplastic polymeric material.

8. The method according to claim 1 wherein step A comprises providing a plurality of fabricated containers and step B further comprises

conveying the plurality of fabricated containers supported on a plurality of mandrels in single file, along a serpentine path.

5 9. The method according to claim 1 wherein step A comprises providing a plurality of fabricated containers and step B further comprises conveying the fabricated containers supported on a plurality of mandrels through an oven.

10 10. The method according to claim 1 wherein step C further comprises heating the mandrel to a temperature of from approximately 200°F to approximately 500°F.

15 11. The method according to claim 10 wherein step C further comprises heating the mandrel to a temperature of from approximately 380°F to approximately 410°F.

20 12. The method according to claim 1 further comprising removing the at least one fabricated container from the heated mandrels after a predetermined period of time.

13. An apparatus for producing heat-insulating composite paper containers comprising:

a plurality of spaced apart mandrels for receiving a plurality of respective fabricated containers, each mandrel configured for receiving its respective fabricated container, and

at least one of said mandrels having a selectively heatable portion such that a foamable thermoplastic polymeric material portion on a surface of the respective fabricated container will foam.

14. The apparatus according to claim 13 wherein each mandrel supports its respective container in a substantially vertical orientation.

15. The apparatus according to claim 14 wherein each of the mandrels includes a supporting portion extending through a mouth of a respective fabricated container.

16. The apparatus according to claim 15 wherein each mandrel supports its respective fabricated container in an inverted state, with the supporting portion extending upwardly through the mouth of the fabricated container.

17. The apparatus according to claim 16 wherein a bottom panel of each fabricated container is supported directly on an upper end of a respective supporting portion.

5 18. The apparatus according to claim 13 wherein the heatable portion of the mandrel corresponds to the foamable thermoplastic polymeric material portion on the surface of the fabricated container.

10 19. The apparatus according to claim 13 wherein each of said plurality of mandrels includes a selectively heatable portion.

15 20. The apparatus according to claim 13 wherein a size of said mandrel may be adjusted depending on a size of the respective fabricated container.

21. A method of making a web of heat insulative nonwoven material comprising:

providing a web of nonwoven material;

20 applying a layer of thermoplastic polymeric material to a first surface of the web to form a web laminate;

placing the web laminate in contact with a heated surface;

heating the web laminate and thereby foaming the layer of thermoplastic polymeric material with moisture that is vaporized from the nonwoven material web.

5 22. The method of claim 21, wherein the thermoplastic polymeric material comprises a low density polyethylene foam.

10 23. The method of claim 21, wherein said applying step includes extruding the layer of thermoplastic polymeric material onto the web of nonwoven material.

15 24. The method of claim 21, wherein said placing step includes passing a second surface of the web material over a heated drum such that the second surface is in direct contact with the heated drum.

20 25. The method of claim 24, further comprising heating the drum to a temperature of at least 200°F.

25 26. The method of claim 21, wherein said providing a web of nonwoven material step includes providing a paper sheet substrate.

30 27. The method of claim 26, wherein said providing a paper substrate step includes providing a sandwich wrap material.

28. The method of claim 26, wherein said providing a paper substrate step includes providing a paper board material.

29. The method of claim 21, wherein said heating step includes applying a temperature of at least 200°F to the web laminate.

30. The method of claim 21, wherein placing the web laminate in contact with a heated surface includes placing a second surface of the web of nonwoven material in direct contact with the heated surface, the second surface being opposite to the first surface on which the layer of thermoplastic polymeric material is applied.

31. The method of claim 21, further comprising the step of fabricating the foamed web laminate into a container or a portion of a container.

32. The method of claim 21, further comprising the step of applying a layer of thermoplastic polymeric material to the second surface of the web.

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